



## 1.0 RADIOLOGICAL EMERGENCIES.

a. *General*. Plans and procedures should be developed for the potential situations that could occur. When using military radioactive commodities, the situations most likely to occur are loss or breakage of commodity. Of the two, breakage that results in contamination of personnel and areas is most likely.

We have discussed accidents involving the RADIAC calibrators and the actions to be taken when an incident involving the calibrators occurs. We have also discussed procedures and actions to

prevent the spread of contamination from broken Tritium devices. These same plans and procedures may be used to develop generic plans and procedures that will apply to any commodity with any radioactive source.

EMERGENCY PLANS AND PROCEDURES
<b>POTENTIAL SITUATIONS</b>  <b>FIRE, EXPLOSIONS</b> <b>SPILLS, BREAKAGE AND RELEASES</b> <b>EXCESSIVE RADIATION EXPOSURE</b> <b>PERSONNEL INJURY</b> <b>LOSS OF RADIOACTIVE MATERIAL</b>
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b. *General Procedures*. As a review we will address the general procedures for accidents or incidents.

- Life saving actions have first priority.
- Secure the area, confine the contamination.
- Monitor affected personnel.
- Report the incident.
- Retrieve radioactive material.
- Decontaminate and monitor.
- Release area, dispose of waste, issue report.

(1) Secure the Area. To secure the area, you will evacuate all non-involved personnel, define the limits of possible contamination, confine the limits of contamination if possible, and identify possible personnel contamination. Mark the area and do not allow casual personnel to enter. The exact steps to be taken will depend upon the situation and location. Other factors such as weather, mission, etc., must be considered.

(2) Monitor affected personnel. For external contamination, use a survey meter with the beta window open. A pancake probe is ideal. Move the probe window slowly over areas of suspected contamination while holding the window approximately 1/8 inch from the surface. In case of tritium contamination, if powdered phosphor is present, remove outer clothing and send to shower. If internal contamination is suspected, perform external decontamination and assess requirements for bioassay.

(3) Report the incident. This you should do as soon as you are sure that no personnel are in life-threatening situation. Use the "Radiation Incident Report Form" as a guide to the information you need to develop for a complete report.

GENERAL PROCEDURES
<b>LIFE SAVING PROCEDURES HAVE PRIORITY.</b>  <b>SECURE THE AREA, CONFINE CONTAMINATION</b>  <b>MONITOR AFFECTED PERSONNEL</b>  <b>REPORT THE INCIDENT</b>  <b>RETRIEVE RADIOACTIVE MATERIAL</b>  <b>DECONTAMINATE AND MONITOR</b>
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(4) Retrieve the radioactive material. This may or may not be possible. When you are developing your procedures, you will know what material you will have and you will know if retrieval is possible.

(5) Decontaminate. The method of decontamination and the extent of decontamination will depend upon the situation. In all cases, work from the outside in, wear appropriate protective equipment, use the appropriate decontamination method. After decontamination, monitor to determine if the area is free from contamination.

(6) Release the area, and make the after action report. This report will explain the actions taken, the decontamination methods used, and include the monitoring results. If bioassays were taken and analyzed, include the results of the bioassays.

c. Decontamination. The type of radiation, the location of the contamination, and the environment will affect the decontamination method to be used. In all cases, remember the following:

(1) Minimize the spread of contamination. Do not use a method that will cause further spread of the material, such as a high pressure water spray, or an air stream.

(2) Restrict access to the area to minimum the number of personnel required.

(3) Wear protective clothing or equipment as required by the level of contamination.

(4) Minimize waste generation. Restrict water run-off. Limit water usage. Use “spray and wipe” technique.

(5) Monitor the area, and do not release the area until monitoring results indicate that the area is clean.

d. Contamination Prevention. Certain prior steps can prevent serious contamination when working with or transporting radioactive commodities. Your operating procedures covering maintenance and storage of the commodities should include good work practices that will reduce contamination in the event of an accident or incident.

e. Major Incidents. The major contamination events that have occurred in military facilities are contamination resulting from broken tritium devices. It is possible that contamination can occur from damage to the M43A1 detector for the M8A1 Chemical Agent Alarm, and from the Chemical Agent Monitor (CAM). These commodities contain radioactive material in a form, that may be dispersed if the item is damaged.

RADIATION INCIDENT REPORT		
DATE:	TIME:	
ITEM DESCRIPTION:		
NSN.	NOMENCLATURE:	
ISOTOPE:	ACTIVITY:	DATE OF ACTIVITY:
TIME OF INCIDENT:	DATE OF INCIDENT:	DATE DISCOVERED:
LOCATION OF INCIDENT:		
STATE:	CITY:	STREET:
BLDG NO:	ROOM:	OTHER:
PERSONNEL INVOLVED:		
ACTIONS TAKEN:		
SITUATION STATUS:		
ASSISTANCE REQUIRED:		
REPORT COMPLETED BY(Name, Grade & Position):		
PHONE:		

## 2.0 DECONTAMINATION.

a. Survey. Before performing the survey you must know the type of radiation emitted by the contamination and the energy of the radiation. Alpha radiations require an alpha detector and beta-gamma emitters require a beta-gamma probe. In addition the energy of the radiation must be considered. Although H-3 and Ni-63 are both beta emitters, H-3 cannot be detected with portable survey instruments and Ni-63 can only be detected by instruments having a very thin window. When using a survey meter to monitor contamination, place probe window close to the surface (approximately 1/8 inch) and move probe slowly over the surface.

### SURVEY FOR CONTAMINATION

**TYPE OF RADIATION - Alpha or Beta/Gamma.**

**ENERGY OF RADIATION - H-3, or Ni-63 are low energy radiations.**

**USE THIN WINDOW PANCAKE PROBE.**

**CLOSE TO SURFACE, SLOW MOVEMENT OF DETECTOR PROBE.**

**SWIPE FOR TRITIUM OR NICKEL.**

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For H-3 and Ni-63, use wipes. For H-3 you must use the nitrocellulose filter, for Ni-63, you may use the nitrocellulose filter or you may use the NUCON wipe. Some laboratories count Ni-63 in a liquid scintillation counter and require the nitrocellulose filter. The nitrocellulose filter is preferred for Ni-63 monitoring. Other laboratories may use a gas-flow counter that can count the NUCON wipe.

When swiping, always swipe a known area, in square inches or square centimeters, and note the area on the form when submitting swipes to laboratory for counting.

b. Personnel Decontamination. When personnel are suspected of being contaminated:

- (1) Remove the contaminated clothing.
- (2) If shower facilities are available, shower and shampoo.
- (3) Monitor body surface with the appropriate instrument, if appropriate.
- (4) Repeat washing any areas of the body that indicate contamination. Repeat as required.

### DECONTAMINATION OF PERSONNEL

**REMOVE CLOTHING AND BAG.**

**SHOWER AND SHAMPOO, IF FACILITIES ARE AVAILABLE.**

**MONITOR SKIN SURFACE WITH APPROPRIATE INSTRUMENT.**

**WASH w/SOAP, RINSE, DRY AND MONITOR AGAIN.**

**REPEAT AS REQUIRED.**

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NOTE: The hands are subject to become contaminated, and may be difficult to decontaminate. Do not use abrasive soaps, use tepid (body temperature) water, rinse and dry. Absorbed contaminants may be "sweated out" by wearing rubber gloves.

c. Area Decontamination. (Interior Areas).

- (1) Isolate the area. Identify the extent of contamination, remove excess personnel, rope area or otherwise identify area.

(2) Wear gloves and shoe covers. Additional protection, such as disposable coveralls may be required.

(3) Pick up large items and bag. Items in the area that are not easily decontaminated such as radios, cameras, papers, etc., are disposed of as contaminated waste.

(4) Spray and wipe the area. For small areas use paper towels, for large areas use swabs or mops that will be disposed of.

(5) Bag all waste.

(6) Swipe the area, isolate the area until the swipe results are known.

(7) After the area is clean, release the area for normal use.

d. Shop Bench Decontamination.

(1) Bag & tag the item. Place the item in a double plastic bag and tag with a notice that the item is contaminated.

(2) Bag the paper bench cover. Provided you had covered your work bench wipe paper prior to working on a radioactive commodity.

(3) Survey, if possible. If radiation cannot be detected by survey meter, use swipes, or assume that area is contaminated.

(4) Spray and wipe the entire surface of work bench and floor surrounding the bench. Clean floor out to a distance that is estimated to cover the possible contaminated area.

(5) Swipe - do not use the area. Keep the area isolated until swipe results are known.

(6) Release the area for use when the swipes results indicate that the area is clean.

e. Outdoor Incident Decontamination.

(1) Isolate the area, retrieve the device. Exercise care during retrieval of the device. Do not spread the contamination.

#### DECONTAMINATION OF AREAS

**ISOLATE AREA, IDENTIFY EXTENT.**

**WEAR GLOVES AND SHOE COVERS.**

**PICK UP LARGE ITEMS AND BAG.**

**SPRAY AND WIPE AREA w/PAPER OR CLOTH TOWELS.**

**DISPOSE OF WIPES AS RAD WASTE.**

**SWIPE AREA, CONTINUE ISOLATION UNTIL SWIPES INDICATE AREA IS CLEAN.**

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#### SHOP DECONTAMINATION

**BAG AND TAG ITEM.**

**BAG PAPER COVERING BENCH.**

**SURVEY, IF POSSIBLE.**

**SPRAY AND WIPE ENTIRE SURFACE AND FLOOR.**

**SWIPE - KEEP AREA OFF LIMITS.**

**RELEASE AREA WHEN SWIPES INDICATE AREA IS CLEAN.**

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(2) Mark off or otherwise identify the affected area. The affected area is the area around the device and/or any part of the device if the device has been damaged.

(3) Maintain control of the area.  
Prevent traffic in or through the area.

(4) Obtain decontamination equipment such as plastic bags, shoe covers, and gloves.

(5) If the soil is contaminated, identify extent of contamination. Bagging of the soil may be required.

(6) If device is not a tritium source. Survey the area, and bag all soil and vegetation indicating activity greater than background.

**OUTDOOR AREA  
DECONTAMINATION****ISOLATE AREA, RETRIEVE DEVICE(S)****MARK OFF/IDENTIFY AREAS****MAINTAIN CONTROL OF AREA****OBTAIN EQUIPMENT SUCH AS PLASTIC BAGS,  
SHOE COVERS, ETC.****BAG CONTAMINATED ITEMS****MONITOR, RELEASE AREA WHEN CLEAN****Slide 7**